SPC-530

Rackmount Server PC

User's Manual

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Acknowledgments

SPC-530MB, SPC-530BP, SPC-530MB-U2C, SPC-530BP-U2C series and PCA-6120P4, PCA-6119P7, PCA-6119P17, PCA-6120DP4, PCA-6118DP7 series are trademarks of Advantech Co., Ltd.

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Chapter 1 General Information

1.1 Introduction

The SPC-530MB / SPC-530BP, the PC/AT-compatible computer, is designed for high-reliability applications. Not only easily installed and maintained in mission critical applications and harsh environments, it is also a high-end rackmount fault-resilient server PC. The SPC-530BP can be fitted with a 20-slot PC-bus compatible passive backplane. The SPC-530MB can be fitted with an ATX motherboard. Both the SPC-530BP and SPC-530MB provide one 400-watt ATX redundant power supply and three hot-swap cooling fans. They accept up to six front-access half-height disk drives.

The SPC-530BP / SPC-530MB features an advanced fault detection and alarm notification system to monitor its own hardware status. If your PC system shuts down without advance warning, this can be dangerous and may cause considerable loss.

1.2 Model list

Model Name	Backplane	Redundant, Hot-swap 400-watt ATX AC-DC PSU	SCSI Ultra2 Wide RAID Card w/ cable	Disk Cartridges x 5 sets
SPC-530BP	20-slot passive backplane	YES	----	----
SPC-530MB	*** (Reserve the space for ATX mother board)	YES	----	----
SPC-530BP-U2C	20-slot passive backplane	YES	YES	YES
SPC-530MB-U2C	*** (Reserve the space for ATX mother board)	YES	YES	YES

The SPC-530BP-U2C and SPC-530MB-U2C include five disk cartridges installed in vertical disk drive space. There is one horizontal disk drive space reserved for other storage drives such as a CD-ROM drive.

1.3 Specifications

- **Construction**: Heavy-duty steel chassis
- **Disk drive capacity**: Five half-height front-access drives (vertical), and one half-height drive (horizontal)
- **Cooling system**: Three 86 CFM cooling fans inside the chassis
- **Controls**: Power On/Off switch on power supply module in front panel. Alarm reset button, ATX soft switch and system reset button on the front panel
- **Indicators**: Bicolor LEDs (green and red) for power failure, fan failure and overheating. LED indicator (green) for system power On/Off
- **Buzzer**: One buzzer for audio alarm / volume control on board
- **Dimensions**: 19" (W) x 8.75" (H) x 26" (D), 482 mm (W) x 222 mm (H) x 660 mm (D)
- **Net weight**: SPC-530MB / SPC-530BP: 46.2 lb (21 kg)

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- **Paint color:** Front panel: Pantone Black 4C 2X; Chassis: Brushed finish, Ni
- **Operating temperature**: 0 to 50° C (32 to 122° F)
- **Relative humidity**: 20 to 90%
- **CE compliant**

Hot-swap AC-DC 400-watt ATX redundant power supply (RPS-400ATX)

- **Output rating**: 400 watts (max.)
- **Input voltage**: 90 to 132 V_{AC} or 180 to 264 V_{AC} @ 47 ~ 63 Hz, switchable
- **Output voltages**: +5 V @ 42 A, +3.3 V @ 20 A, +12 V @ 14 A, -5 V @ 1 A, -12 V @ 1 A
  +5 Vsb @ 0.75 A (+5 V / +3.3 V; Total: 210 watts)
- **Minimum load:** +5 V @ 2 A, +3.3 V @ 0.3 A, +12 V @ 0.5 A
- **MTBF**: 100,000 hours at 25° C, 70% load
- **Safety**: UL/C-UL/TUV/CE approved

Passive backplane options (for SPC-530BP / SPC-530BP-U2C)

Backplane Model Name	Slots per Segment	Segment(s)
PCA-6120P4	15 ISA / 4 PCI / 1 PICMG	Single
PCA-6119P7	11 ISA / 7 PCI / 1 PICMG	Single
PCA-6119P17	1 ISA / 17 PCI / 1 PICMG	Single

RAID card features (only for SPC-530BP-U2C / SPC-530MB-U2C)

The SPC-530 is available with a RAID to PCI host interface. This gives users numerous extra features. (For more details, please refer to our RAID manual, under SPC-530BP-U2C / SPC-530MB-U2C)

- One/Two Ultra2 Wide SCSI (68-pin) channel(s) on-board
- Automatic bad sector reassignment, Bad Sector Management
- Built-in SCSI terminator
- RAID 0, 1 (0+1), 3, 5
- Auto-rebuilding
- Hot-spare drive operation
- Disk hot-swapping
- Self-diagnostics
- Complete OS support: MS-DOS, Windows 95/98, Windows NT, NetWare, OS/2, SCO UnixWare, Sun Solaris and Linux

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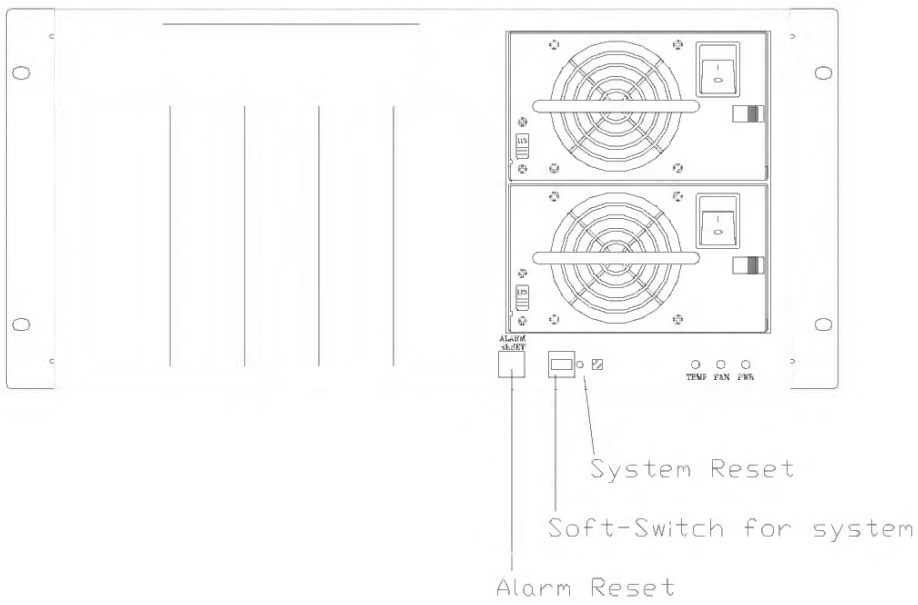
Fault detection and alarm notification

- **Power failure:** This operates only when you have installed the redundant power supply (RPS-400ATX). If either of the two power modules fails, the dedicated LED (PWR) changes color from green to red, and an audio alarm also sounds. The dedicated LED remains red for the failed power module until it is fixed.
- **Fan failure:** If any of the three cooling fans fails, the dedicated LED changes color from green to red, and an audio alarm also sounds. The dedicated LED remains red for the failed fan until it is fixed. The fan assembly can be hot-swapped if any fan fails.
- **High temperature:** If the chassis interior temperature exceeds 65° C (149° F) (standard setting), the LED changes color from green to red, and an audio alarm also sounds. The LED remains red until the temperature drops below 63° C.
- **Temperature select:** The temperature threshold can be adjusted to one of four readings, by setting the switch on the alarm board: 65° C (default setting), 55° C, 70° C and 75° C.
- **Audible alarm:** A buzzer on board is activated (continous beep) as soon as a malfunction is detected, and sounds until the alarm reset button is pressed. The alarm reset button is on the front panel. However, the alarm indicator will stay red until the fault condition is resolved.
- **Self-test:** Press the alarm reset button for 8 seconds, and the alarm board will self-test automatically for all functions. The alarm board can also monitor the temperature's sensor IC. If the sensor has failed, or there is no connection, the buzzer will sound a " Beep x Beep x ..." alarm.

Controls for the system

The SPC-530 series' front panel provides one soft switch and one system reset button to re-boot the PC system. See the following figure:



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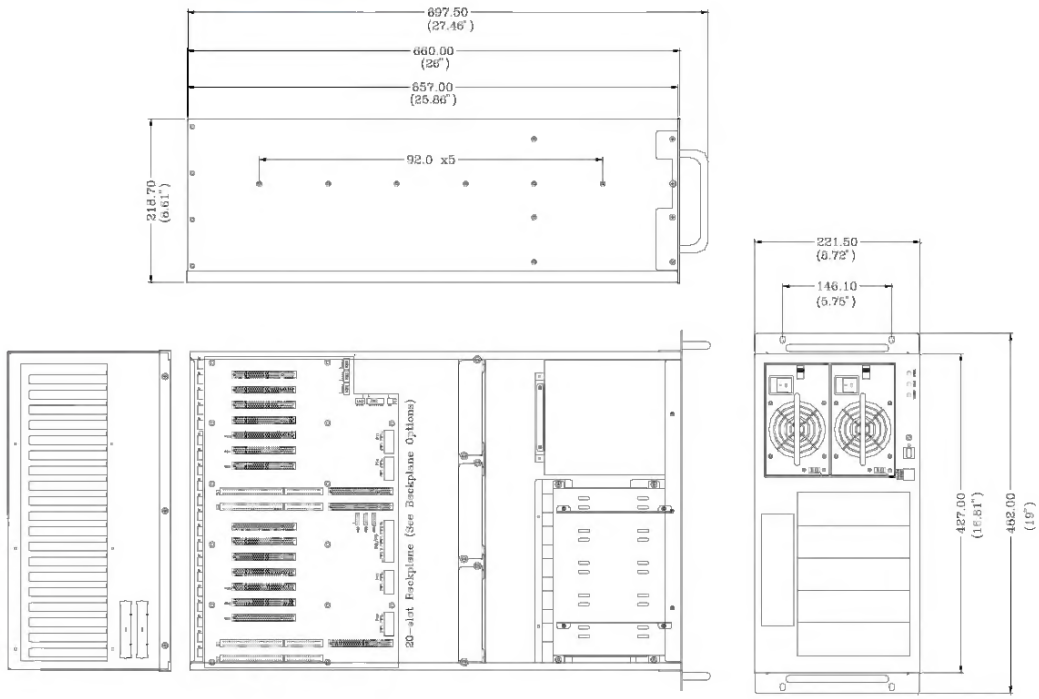
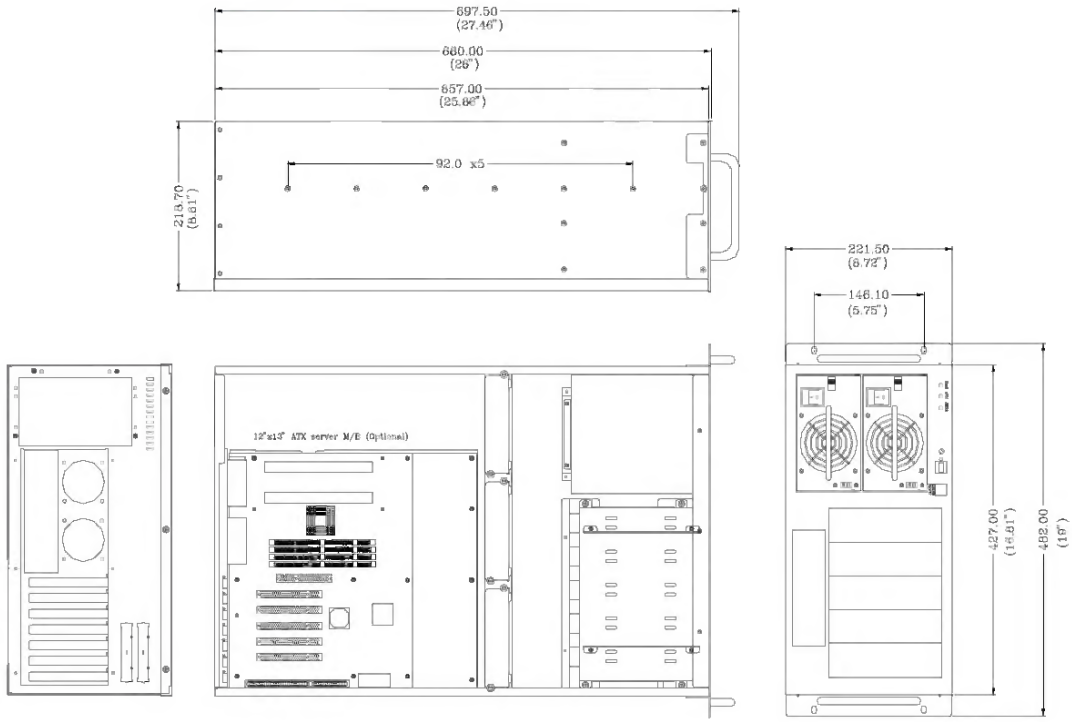
1.4 Dimensions

Unit = mm

SPC-530BP (Can be fitted with a 20-slot backplane)



SPC-530MB (Can be fitted with a 12" x 13" motherboard)



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Chapter 2 System Setup

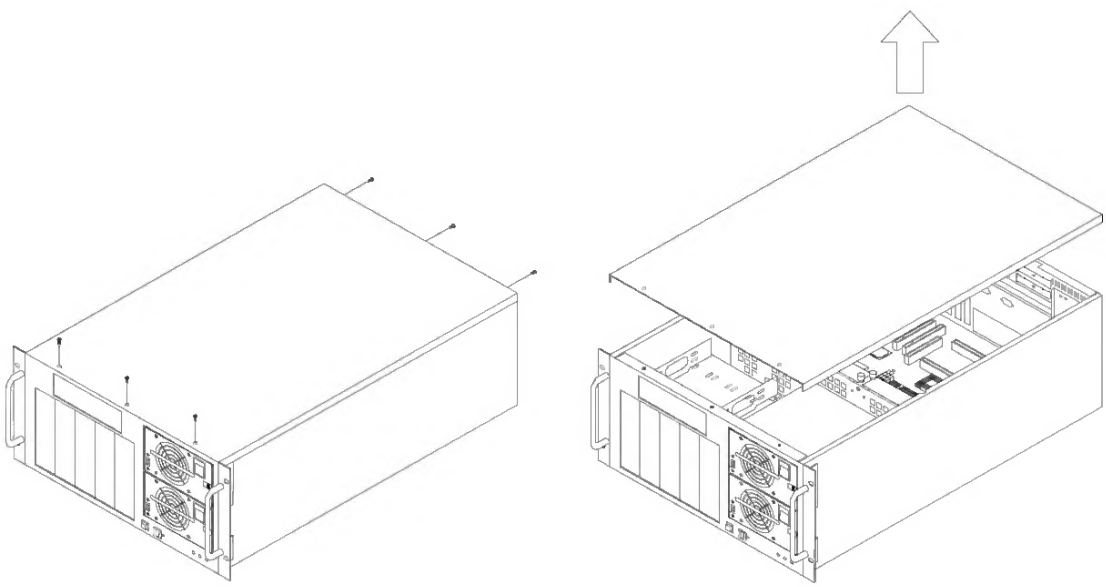
The SPC-530 series is an ATX-compatible computer designed for industrial applications. This rugged chassis meets the EIA RS-310C 19" rackmount standard.

Setting up your SPC-530 series requires only a screwdriver and a small amount of time. Before you begin, you should also gather together all of the cards you plan to install, as well as the disk drives you plan to use.

WARNING: ***Disconnect all power from the chassis before you install the CPU cards. Unplug the power cord from the wall, Do not just turn off the power switch. If you are not sure what to do, take the job to an experienced professional.***

2.1 Removing the cover

There are screws near the top, along the sides, and on the rear to secure the cover to the chassis. Remove them, and then you can lift the cover free of the chassis. See Figure 2.1 below:



2.1 Removing the cover

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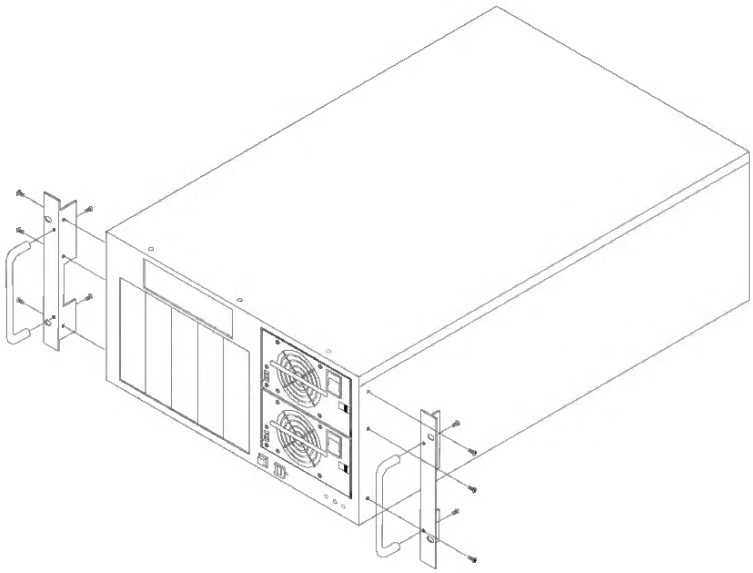
2.2 Removing the handles

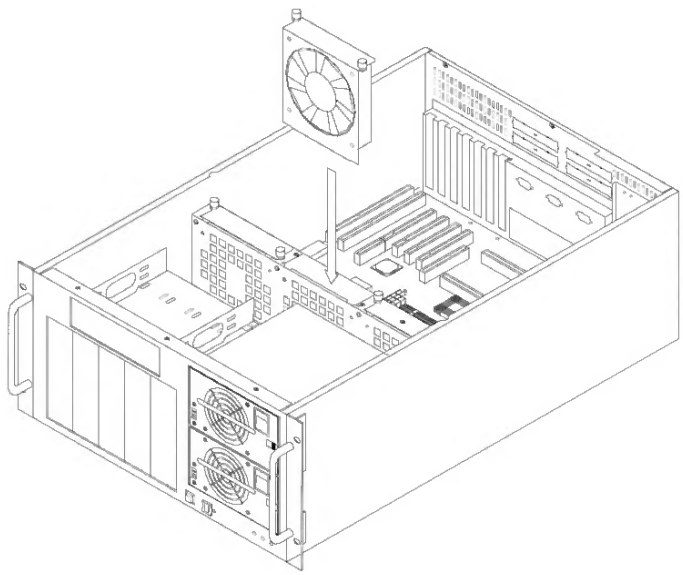
The handles and mounting ears for the front panel can be removed as follows. Please see Figure 2.2 below:



2.2 Removing the handles

2.3 The cooling fans

There are three cooling fans inside the chassis. To replace or service the fans, open the top cover as in Figure 2.1. Loosen the thumbscrews, and pull out the whole fan assembly. Please refer to Figure 2.3 below:



2.3 Cooling fans

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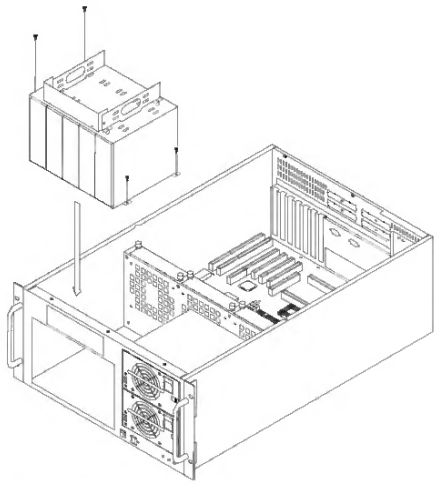
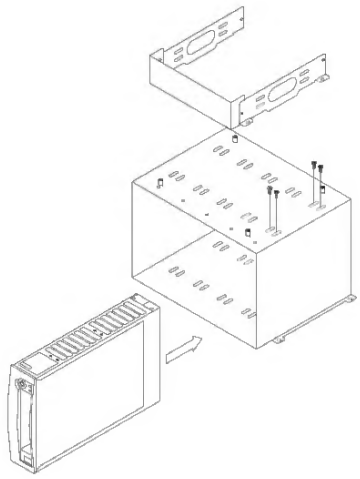
2.4 Installing the disk drives

1. Open the top cover as in Figure 2.1. There is one independent disk drive bay on the front of the chassis. Remove the four outer screws which mount the drive bay to the chassis. Slide the drive bay toward the rear of the chassis, and lift it free of the chassis. See Figure 2.4 below.
2. Remove the front cover of the drive bay, and insert the drives into their proper locations in the drive bay. See Figure 2.5.



2.4 Removing the disk drive bay



2.5 Inserting the drives into the drive bay

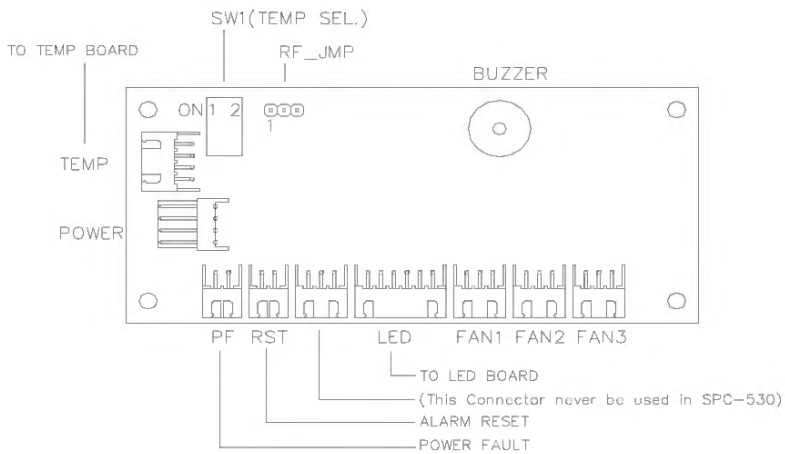
2.5 Temperature setting

If the chassis interior temperature exceeds 65° C (149° F) (default setting), the LED changes color from green to red. There is also an audio alarm. The LED remains red until the temperature drops below 63° C.

The default of the "RF_JMP" is PIN1-2: ON, which enables redundant power detection.

Temperature can also be selected (via SW1) on the alarm board inside the chassis:

SW1		
1	2	TEMP
OFF	OFF	65° C
OFF	ON	55° C
ON	OFF	70° C
ON	ON	75° C



2.6 Alarm board

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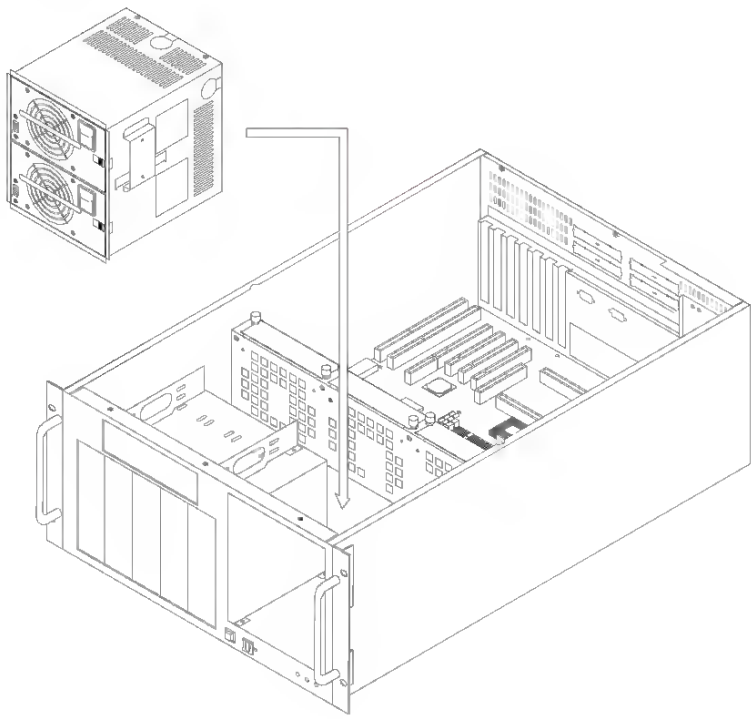
2.6 Installing the power supply unit

There is one 400 W ATX redundant power supply installed at the front of the chassis. The power module can be hot-swapped for maintainence.



2.7 ATX redundant power supply

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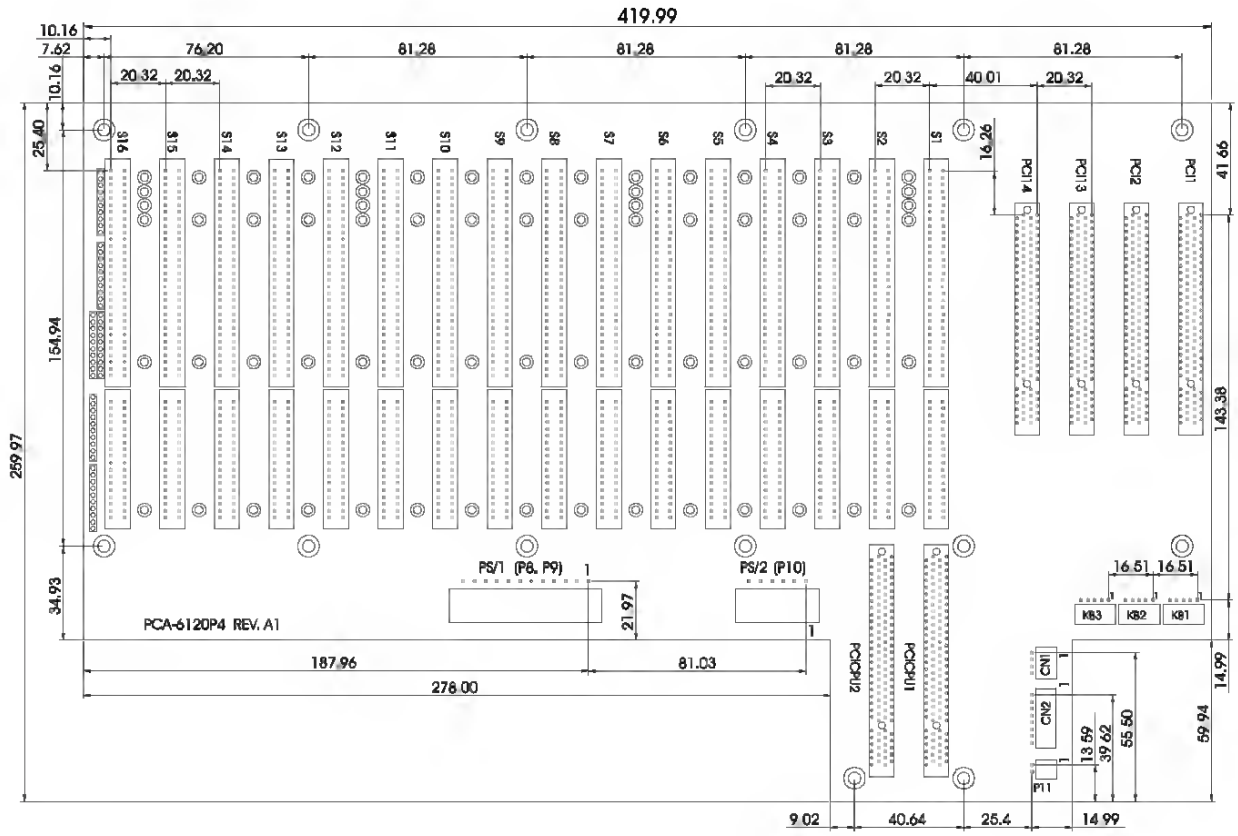
Appendix A Backplanes (Optional)

PCA-6120P4 Rev. A1: 15 ISA / 4 PCI / 1 PICMG-slot passive backplane

Dimensions: 420 x 260 mm



Termination resistor signals

The termination resistors provide an impedance mismatch at the end of the bus, to prevent signal reflections. This mismatch has to be balanced by the capability of the CPU and optional cards to electrically drive the load imposed by the resistor.

Resistor	Signals	Resistor	Signals
RN1, RN8	SA7-SA0	RP1, RP2	MEMW, SMEMR, IOW, 1OR
RN4, RN11	SA15-SA8	RN2, RN12	SBHE, LA23-LA17
RN5, RN10	SD0-SD7	RN6, RN7	SA19-SA16
RN3, RN9	SD8-SD15		

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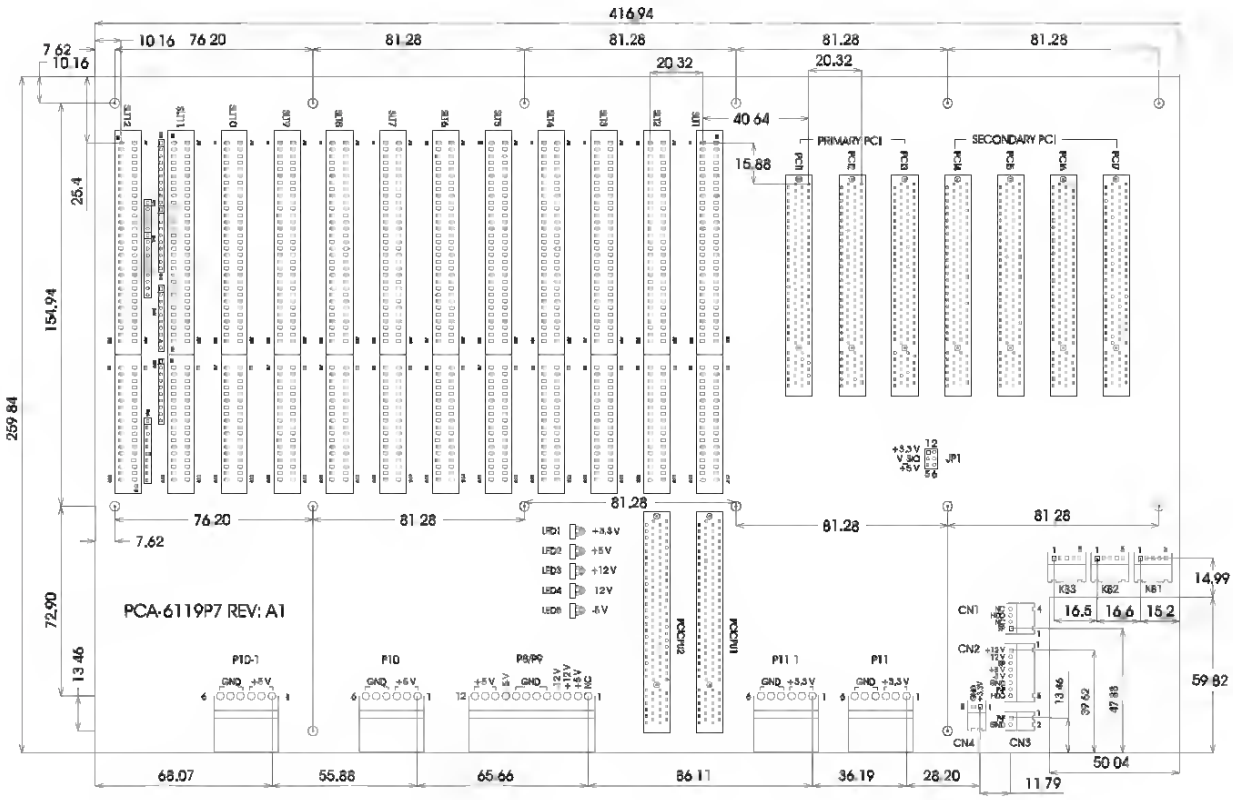
PCA-6119P7 Rev. A1: 15 ISA / 4 PCI / 1 PICMG-slot passive backplane

Dimensions: 420 x 260 mm



1. CONNECTORS

CONNECTOR	DESCRIPTION
SLT1 ~ 2	PICMG connectors
SLT3 ~ 12	16-bit ISA-bus connectors
PCI1 ~ 3	32-bit PCI-bus connectors (primary)
PCI4 ~ 7	32-bit PCI-bit connectors (secondary)
KB1 ~ 3	5-pin external K/B connectors
CN1	4-pin HDD and SP connectors
CN2	8-pin power (±5 V, ±12 V), SP, HDD and P-F connector
CN3	2-pin P-F connector
CN4	2-pin +3.3 V DC power connector
P11, P11-1	6-pin +3.3 V DC power connectors
P10, P10-1	6-pin +5 V DC power connectors
P8/P9	To PS/2 power connector
JP1	V_IO for secondary PCI bus

JP1	
1-3, 2-4 closed	V_IO = +3.3 V for secondary PCI bus
✳ 3-5, 4-6 closed	V_IO = +5 V for secondary PCI bus

✳ Default

2. PIN ASSIGNMENTS

KB1 ~ 3	
PIN	NAME
1	KBDCLK
2	KBDDATA
3	NC
4	GND
5	+5 V

P10, P10-1	
PIN	NAME
1	+5 V
2	+5 V
3	+5 V
4	GND
5	GND
6	GND

P8/P9	
PIN	NAME
1	NC
2	+5 V
3	+12 V
4	-12 V
5	GND
6	GND
7	GND
8	GND
9	-5 V
10	+5 V
11	+5 V
12	+5 V

CN1	
PIN	NAME
1	SP
2	NC
3	HDD
4	NC

P11, P11-1	
PIN	NAME
1	+3.3 V
2	+3.3 V
3	+3.3 V
4	GND
5	GND
6	GND

CN2	
PIN	NAME
1	+12 V
2	-12 V
3	SP
4	+5 V
5	-5 V
6	GND
7	P-F
8	HDD

CN3	
PIN	NAME
1	P-F
2	GND

CN4	
PIN	NAME
1	+3.3 V
2	GND

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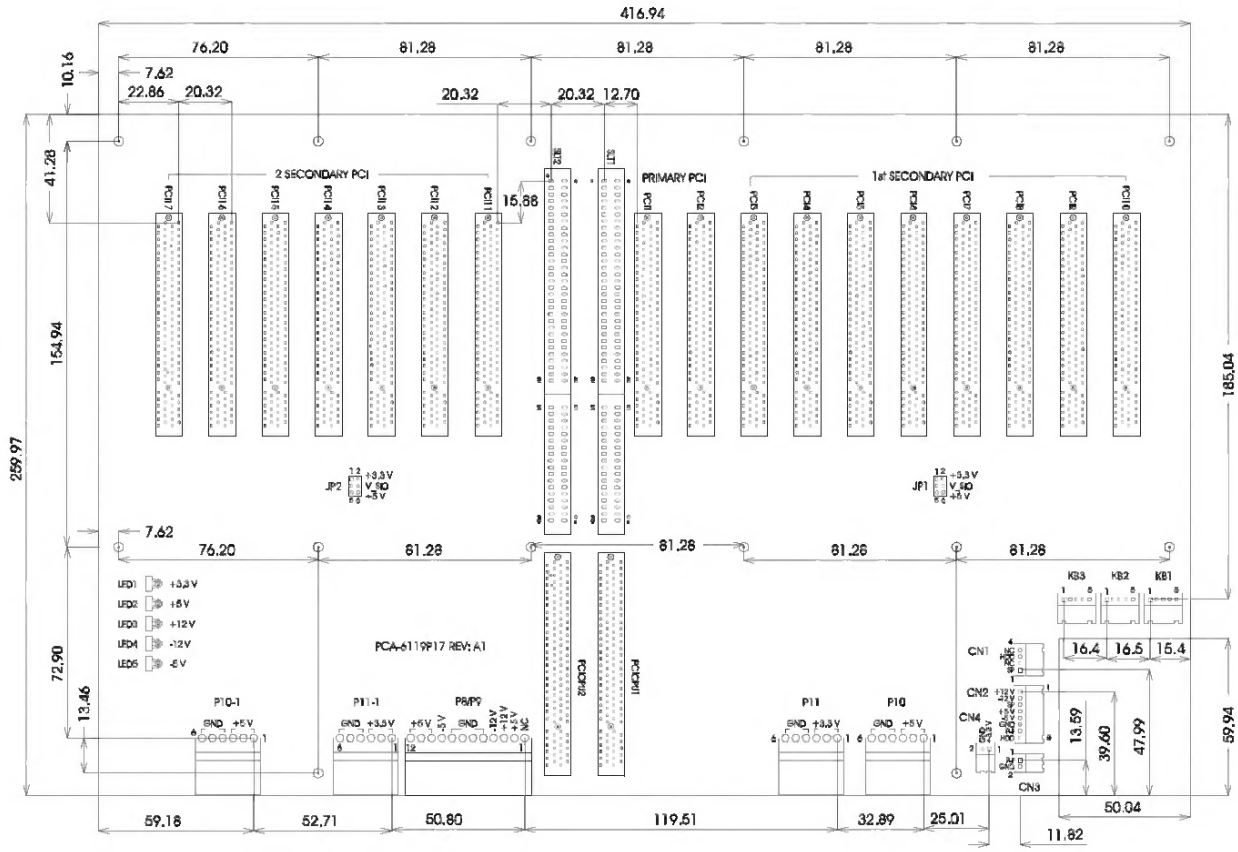
PCA-6119P17 Rev. A1: 1 ISA / 17 PCI / 1 PICMG-slot passive backplane

Dimensions: 420 x 260 mm



1. CONNECTORS

CONNECTOR	DESCRIPTION
SLT1 ~ 2	PCIMG connectors
PCI1 ~ 2	32-bit PCI-bus connectors (primary)
PCI3 ~ 10	32-bit PCI-bus connectors (1 secondary)
PCI11 ~ 17	32-bit PCI-bus connectors (2 secondary)
KB1 ~ 3	5-pin external K/B connectors
CN1	4-pin SP and HDD connector
CN2	8-pin power (±5 V, ±12 V), SP, HDD and P-F connector
CN3	2-pin P-F connector
CN4	2-pin +3.3 V DC power connector
P8/P9	To PS/2 power connector
P1D, P10-1	6-pin +5 V DC power connectors
P11, P11-1	6-pin +3.3 V DC power connectors
JP1	V - IO for 1st secondary PCI bus
JP2	V - IO for 2nd secondary PCI bus

2. PIN ASSIGNMENTS

KB1 ~ 3	
PIN	NAME
1	KBCLK
2	KBDATA
3	NC
4	GND
5	+5 V

P8/P9	
PIN	NAME
1	NC
2	+5 V
3	+12 V
4	-12 V
5	GND
6	GND
7	GND
8	GND
9	-5 V
10	+5 V
11	+5 V
12	+5 V

CN1	
PIN	NAME
1	SP
2	NC
3	HDD
4	NC

CN2	
PIN	NAME
1	+12 V
2	-12 V
3	SP
4	+5 V
5	-5 V
6	GND
7	P-F
8	HDD

P1D, P10-1	
PIN	NAME
1	+5 V
2	+5 V
3	+5 V
4	GND
5	GND
6	GND

P11, P11-1	
PIN	NAME
1	+3.3 V
2	+3.3 V
3	+3.3 V
4	GND
5	GND
6	GND

CN3	
PIN	NAME
1	P-F
2	GND

CN4	
PIN	NAME
1	+3.3 V
2	GND

JP1	
1-3, 2-4 closed	V_IO = +3.3 V for 1st secondary PCI bus
✳ 3-5,4-6 closed	V_IO = +5 V for 1st secondary PCI bus

JP2	
1-3, 2-4 closed	V_IO = +3.3 V for 2nd secondary PCI bus
3-5, 4-6 closed	V_IO = +5 V for 2nd secondary PCI bus

✳ Default

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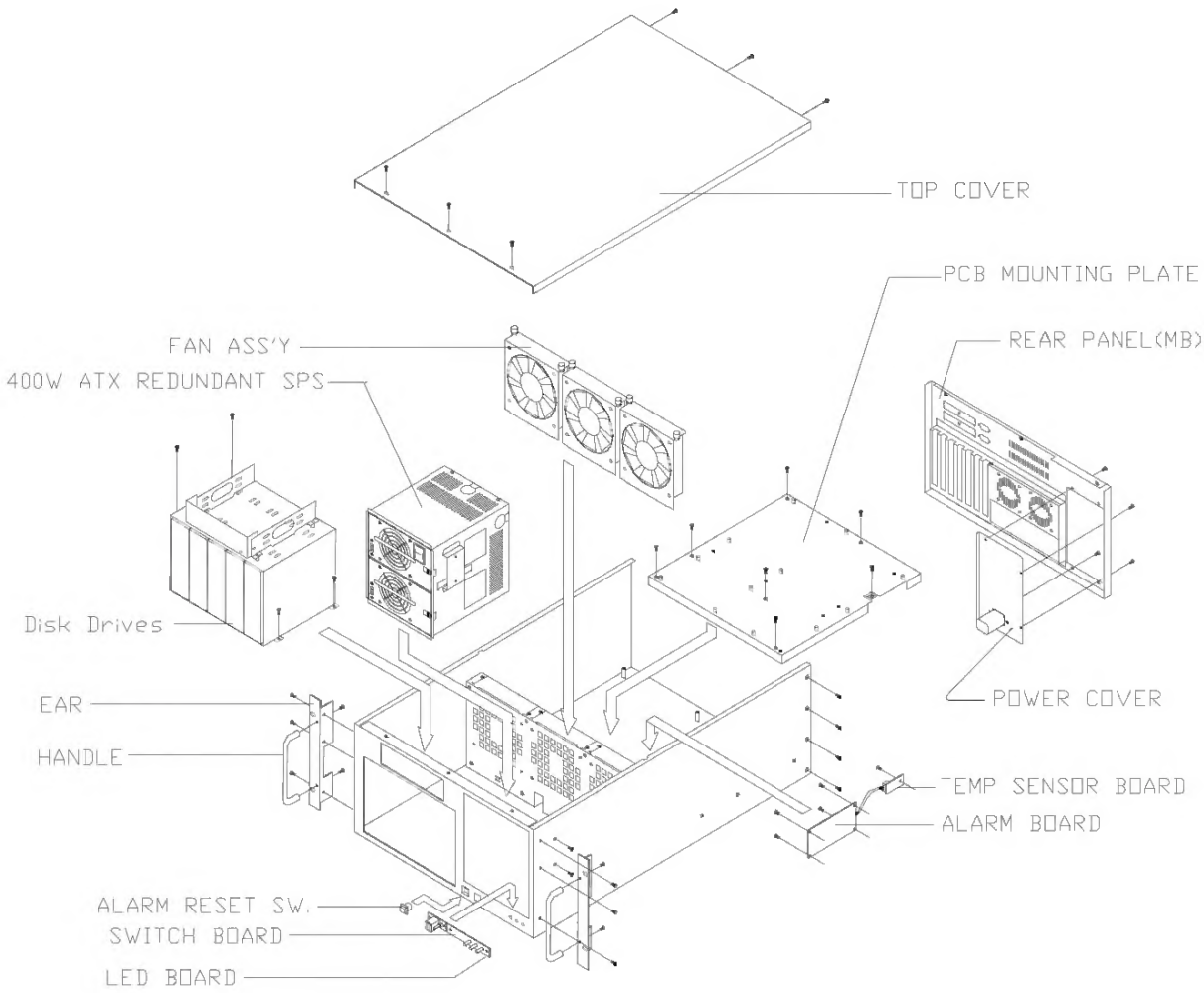
Appendix B Exploded Diagrams

SPC-530MB



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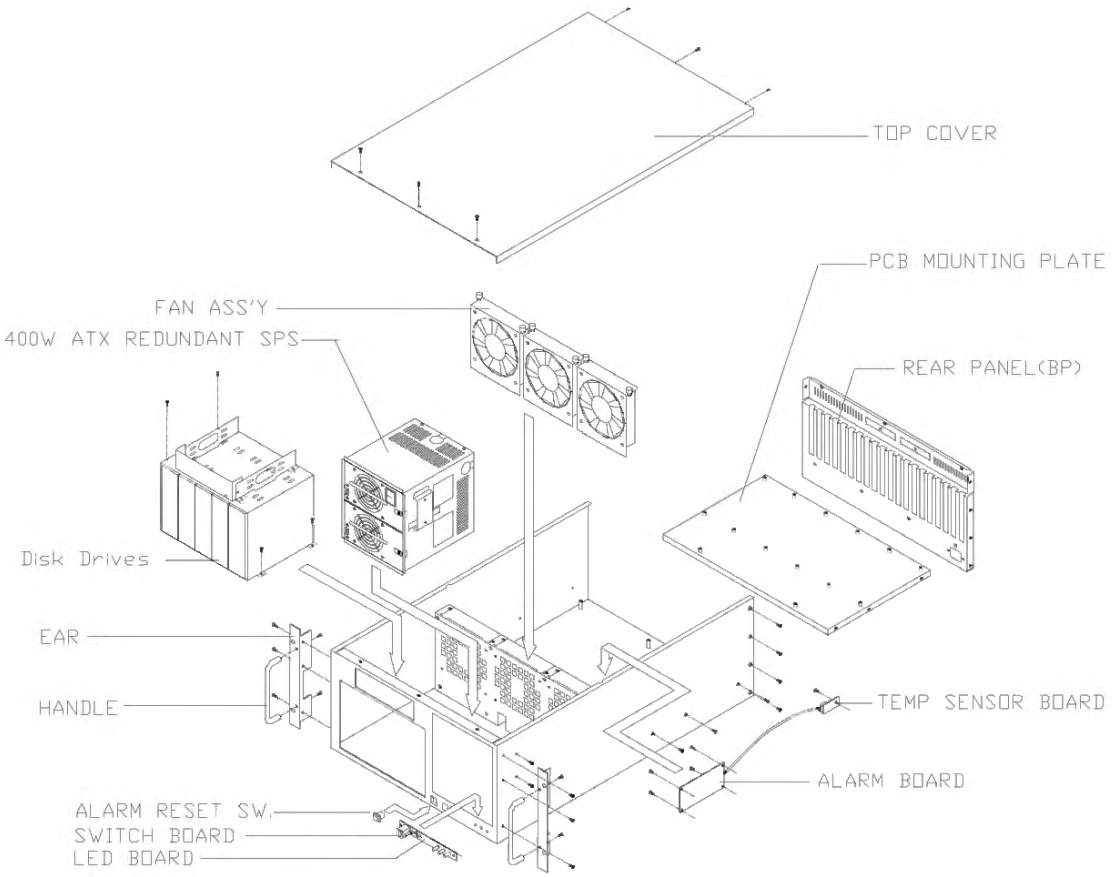
SPC-530BP



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Appendix C Safety Instructions

1. Please read these safety instructions carefully.
2. Please keep this User's Manual for later reference.
3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or sprayed detergent for cleaning. Use a moist sheet or cloth.
4. For pluggable equipment, the socket-outlet must be installed near the equipment and must be easily accessible.
5. Please keep this equipment free from humidity.
6. Lay this equipment on a reliable surface when installed. A drop or fall could cause damage.
7. The openings on the enclosure are for air convection, so protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure of the voltage of the power source when connecting the equipment to the power outlet.
9. Position the power cord such that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment must be noted.
11. If the equipment is not used for a long time, disconnect it from the mains. This prevents the equipment from being damaged by transient overvoltage.
12. Never pour any liquid into an opening. This can cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should only be opened by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped or damaged.
    f. The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONDITIONED ENVIRONMENT WITH STORAGE TEMPERATURES BELOW -20°C (-4°F) OR ABOVE 60°C (140°F), AS THIS MAY DAMAGE THE EQUIPMENT.

The sound pressure level at the operator's position according to IEC 704-1:1982 is equal to or less than 70 dB(A).

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